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DD/ST# 3025-64

November 5, 1964

10: *[Signature]*
Mr. Robert M. Chapman
2430 E Street
Washington, D. C.

Dear Mr. Chapman:

25X1A5a2 Confirming our recent conversation, *[Redacted]* is a small, technically oriented company which to date has been primarily concerned with the design and development of cryogenic equipment and the possible applications of low temperature phenomena. Our specific activities may be summarized as follows:

- a. Refrigeration. Design and development of small, miniature closed-cycle refrigerators. Based on both Claude and Stirling cycles, these units involve a new type of drive mechanism and dry compressor and operate in the range 4-70°K.
- b. Helium-3 cryostats. Our helium-3 cryostat is currently being sold as a research tool for operation at .3°K.
- c. Cryogenic instruments for measurement of liquid levels, temperature control and temperature indication at cryogenic temperatures.
- d. Superconductivity. This activity is related particularly to extremely high field strength magnets, i. e., 100,000 gauss and above. This operation has been conducted in collaboration with a materials producer and a wide variety of high field strength coils have been investigated. Studies have been undertaken relating to superconducting transmission lines, transformers, motors and generators.
- e. Dewars. Working in collaboration with another company, we both manufacture and distribute a line of liquid helium and liquid nitrogen dewars.

Contractors
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Without further information with regard to your particular requirements, it is difficult to suggest areas to which our particular talents and interests might be appropriately directed. The following might form the basis for further discussion:

a. Infrared emitters. The use of cooled gallium arsenide emitters offer certain possibilities both for the collection and transmission of intelligence by acoustic modulation of I. R. beams.

b. Acoustics. Relatively little development has been undertaken in recent years in the field of acoustics in spite of the fact that a number of new tools are available in the form of both instruments and materials. More glamorous areas of research seem to have attracted the top talents in the country. Further studies may well suggest a number of applications of modern technology in the acoustical field which would offer promising results both for long range and short range activities, including sensing, direction finding and communications. In the very low frequencies, i.e., .5 - 10 cps range, improvements in transducers and application of correlation techniques might be of interest. The development of new emitters and receptors might suggest applications of supersonic beams in ranges between audio and the point of high atmospheric absorption.

c. Intense magnetic fields. In view of the company's interest in this area, we have a natural desire to explore all possible applications. We currently, for example, are exploring techniques for the separation of ores and have studied the possible use of intense fields as both energy sources and underwater signaling devices. At the moment, we are not optimistic about the use of even 100,000 or 200,000 gauss for your requirements.

d. High-Q coils. The possibility of preparing extremely high-Q, i.e., 10^6 , coils through the use of superconducting devices has already been investigated. The use of such coils in the form of either front ends or i.f. strips should have applications in both VLF and medium range frequency receivers.

e. Low Noise Receivers. Both our 4°K and 30°K miniature refrigerators have been developed specifically for paramp and maser receivers. We believe our refrigeration equipment has certain unique operating characteristics but we have no preferred position in this general field.

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i. Infrared Sensors. Our interest involves the supply of equipment in the form of mechanical refrigeration, "desorption" cooling devices, and small J-T expanders operating at 70°K.

25X1A5a2 The ability of [REDACTED] to effectively contribute to a technical program will probably stem from our small size and flexibility. In addition, we operate in close proximity to the people and facilities in the Lincoln Lab., M.I.T. and Harvard community. [REDACTED] and [REDACTED] have been

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25X1A5a2 associated with [REDACTED] since its inception and would be available in a consulting capacity in connection with any programs with which we might become involved.

For a good many years, I have personally been very much interested in work of this type. While my scientific contribution would undoubtedly be limited, I want to assure you that any effort of our company would be pursued with appropriate emphasis and direction.

Very truly yours,

[REDACTED]

Chairman

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CC: Dr. Albert D. Wheelon